

## AMENDMENTS TO THE CLAIMS

Please replace the pending claims with the following claim listing:

1. **(Currently Amended)** An arrayed waveguide grating type optical multiplexer/demultiplexer circuit, comprising on a flat substrate a plurality of first optical waveguides, a first slab waveguide which is connected to the first optical waveguides, an arrayed waveguide, connected to the first slab waveguide, consisting of a plurality of optical waveguides which sequentially become longer with a prescribed waveguide length difference, a second slab waveguide which is connected to the arrayed waveguides, and a plurality of second optical waveguides which are connected to the second slab waveguide; further ~~comprising~~; comprising:

a parabola waveguide in which a width  $W$  of the first optical waveguide contacting with the first slab waveguide is defined by the following equation with respect to a propagation axis  $Z$  of optical wave,

$$Z = A (W^2 - W_0^2) - Z_0$$

where,  $A$ : a coefficient, and  $A > 0$ ,  $W_0$ : a width of the first optical waveguide, and  $Z_0$ : a length from the first slab waveguide;

and a taper waveguide in which a width  $W'$  of the second optical waveguide contacting with the second slab waveguide is defined by the following equation with respect to a propagation axis  $Z$  of optical wave,

$$Z = A' (W' - W_0') - Z_0'$$

where,

$A'$ : a coefficient,  $W_0'$ : a width of the second optical waveguide, and  $Z_0'$ : a length from the second slab waveguide;

wherein the length  $Z_0$  is set within a range defined by the following condition,

$$Z_{a,0} \leq Z_0 \leq Z_{p,0}$$

where  $Z_{a,0}$ : a parabola waveguide length for which a ratio of the amplitude absolute value between a main peak and first side peaks in the field distribution of the parabola waveguide far-field has an upper limit of 0.217, and  $Z_{p,0}$ : a parabola waveguide length for which a relative phase between the main peak and the first side peaks in the field distribution of far-field has a lower limit of 3.14 radians

2.     **(Original)** An arrayed waveguide grating type optical multiplexer/demultiplexer circuit according to claim 1, wherein each waveguide is a silica glass optical waveguide on a flat silicon substrate.